

Dated: Nov. 20, 2002

Signature: Reza Mollaaghababa

(Reza Mollaaghababa)

Docket No.: 101328-0148

(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Theodore H. Fedynyshyn

Application No.: 09/512,942

Group Art Unit: 1752

Filed: February 25, 2000

Examiner: J. Chu

For: ENCAPSULATED INORGANIC RESISTS

**DECLARATION OF THEODORE H. FEDYNYSHYN
PURSUANT TO 37 C.F.R. 1.132**

Commissioner for Patents
Washington, DC 20231

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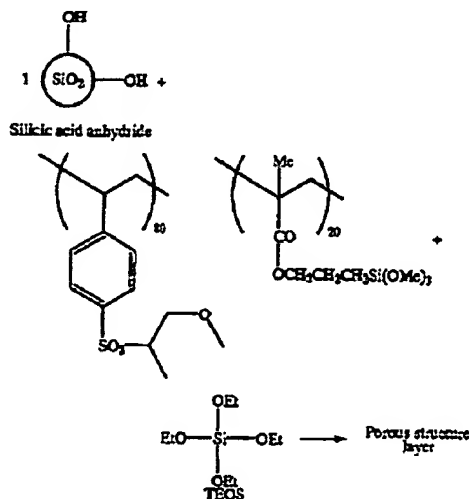
Dear Sir:

I, Dr. Theodore H. Fedynyshyn, a citizen of the United States residing at 32 Atkinson Lane, Sudbury, MA 01776, declare as follows:

1. I received a Ph.D. degree in Chemistry from Brown University in June 1980.
2. I have been employed as a senior scientist at Massachusetts Institute of Technology (MIT) Lincoln Laboratory at 244 Wood Street, Lexington, MA 02420 since October 1997. My responsibilities include conducting and supervising research in the area of resist chemistry, and in particular, in the area of novel resists suitable for use in high energy microlithography.
3. I am the inventor of the invention disclosed in the pending United States Patent Application No. 09/512,942 entitled "Encapsulated Inorganic Resists," which was filed on February 25, 2000. I am familiar with the application and the prosecution conducted to date. In particular, I have studied an Office Action issued on June 20,

2002 in this application and U.S. Patent No. 6,114,083 of Kawamura et al., which was cited in the Office Action to reject claims 1-17 pending in the application.

4. I have studied the formulations disclosed in Kawamura for generating a radiation-sensitive planographic printing plate, and declare that none of these formulations is base soluble. Kawamura's formulations include, in addition to water insoluble particles, the polymerization reaction products of polymer compounds having selected functional groups and a hydrolytic polymerizable agent that can cause cross linking of the polymeric compounds. The cross-linking can be initiated, for example, in response to exposure to heat or radiation.
5. Kawamura states that at least one functional group of the polymer is selected so as to change the formulation from hydrophobic to hydrophilic upon exposure to heat or radiation.
6. As an example of such a functional group, Kawamura discloses an alkoxyalkyl ester group, designated by formula (5) in col. 7 of Kawamura's patent, having a protected hydroxyl group (O-R₃). The protected hydroxyl group can be de-protected, for example, by acid generated by a photoacid generator incorporated in the formulation, in response to radiation exposure. Such de-protection of the protected group, however, does not render the formulation water or base soluble. Rather, it changes the photosensitive layer from hydrophobic to hydrophilic. That is, the formulations disclosed by Kawamura remain water and base insoluble even when exposed to heat or radiation.
7. By way of further illustration, consider the following formulation of Kawamura described in col. 31 of Kawamura's patent:



The above formulation includes a polymeric composition, 80 percent of which is composed of sulfonic acid ester and 20 percent of which is composed of hydrolytic polymerizable trialkoxysilane. In addition, the formulation includes TEOS as a hydrolytic polymerizable cross linking agent, as well as silica particles having surface hydroxyl groups. The cross linking agent causes cross linking of the polymeric compound, and the silica particles via their hydroxyl groups, in three dimensions into a porous water insoluble structure having a plurality of cross-linkages that render it extremely insoluble in water or base. The trialkoxysilane [$\text{Si}(\text{OMe})_3$] group of the polymeric compound can also act as a cross-linker, thereby facilitating formation of the three-dimensional cross-linked structure that is *water and base insoluble*.

8. I further declare that formulations described by Kawamura do not include polyvinyl phenol.
9. I further declare that formulations disclosed by Kawamura do not include novolak polymers.

I further declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that

such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

November 19, 2002

By: Theodore H. Fedynyshyn
Theodore H. Fedynyshyn

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